AMENDMENTS TO THE CLAIMS

This Listing of Claims replaces all prior versions, and listings, of claims in this application.

Listing of Claims:

1.   (Currently Amended) A communications device for detecting user transmitted symbols encoded in spread spectrum user waveforms (hereinafter "user waveforms") comprising

a first processing element which generates a gamma matrix (hereinafter "gamma matrix") representing a correlation between a code associated with one user and those associated with one or more other users, the gamma matrix representing the correlation between user codes as a composition of a complex conjugate of a code sequence associated with one user and a complex conjugate of a code sequence associated with one or more other users; .

a set of one or more second processing elements coupled with the first processing element, the set of processing elements generating a an R-matrix (hereinafter "R-matrix") representing cross-correlations among user waveforms, and

a third processing element coupled with the set of processing elements, wherein the third further processing element generates symbol estimates.

2.   (Currently Amended) The device of claim 1, further comprising

a memory that is coupled to the first processing element and the set of second processing elements,

wherein the first processing element places placing the gamma matrix in the memory for access by the set of second processing elements.

3.   (Currently Amended) The device of claim 2, further comprising

i

a multi-port data switch coupled to the first processing element and to the memory,

wherein the first processing element places the gamma matrix in the memory via the data switch.

4.   (Currently Amended) The device of claim 1, further comprising

a host controller coupled to each of the set of second processing elements, the host controller generates a partitioning of the R-matrix, that partitioning divides the R-matrix into one or more portions based on a number of users and a number of available second processing elements,

the host controller assigns to each second processing element within the set of second processing elements a portion of the R-matrix to generate according to the partitioning,

wherein each one of the set of second processing elements generates the assigned portion of the R-matrix according to the partitioning,

wherein the host controller re-calculates the partitioning of the R-matrix when a user is added or removed from the communications device spread-spectrum-system, and assigns a new portion of the R-matrix to each second processing element within the set of second processing elements according to that new recalculated partitioning.

5.   (Currently Amended) The device of claim 1, further comprising

a memory that is coupled to each of the processing elements in the set of second processing elements and the third processing element,

wherein the set of second processing elements each places placing its respective portion of the R-matrix in the memory for access by the third processing element.

Application No. 10/099,883   Docket No.: 102323-0099

6.   (Currently Amended) The device of claim 5, <u>further</u> comprising

        a multi-port data switch coupled to each of the processing elements in the set of <u>second</u>
        processing elements and to the memory,

        <u>wherein</u> each of the set of second processing elements <u>places</u> ~~placing~~ its respective
        portion of the R-matrix in the memory via the data switch.

7.   (Currently Amended) The device of claim 1, <u>further</u> comprising

        a host controller coupled with the first processing element, the set of <u>second</u> processing
        elements, and the <u>third</u> ~~further~~ processing element,

        the host controller synchronizes data flow between the first processing element and the
        set of second processing elements,

        the host controller synchronizes data flow between the set of second processing elements
        and the third processing element.

8.   (Currently Amended) A communications device for detecting user transmitted symbols
        encoded in spread spectrum <u>user</u> waveforms ~~(hereinafter "user waveforms")~~ comprising

        a first processing element coupled with a multi-port data switch, the first element
        generates a <u>gamma</u> matrix ~~(hereinafter "gamma matrix")~~ representing a correlation
        between a code associated with one user and those associated with one or more other
        users<u>.</u> ~~,~~

        a set of one or more second processing elements coupled with the multi-port data switch,
        each of the processing elements within the set generates a portion of a <u>an R-</u>matrix
        ~~(hereinafter "R-matrix")~~ representing cross-correlations among user waveforms, <u>and</u>

4

Application No. 10/099,883   Docket No.: 102323-0099

a third processing element coupled with the multi-port data switch, the third further
processing element generating generates symbol estimates

wherein the first processing element generates the gamma matrix representing the
correlation between user codes as a composition of a complex conjugate of the code
sequence associated with one user and a complex conjugate of the code sequence
associated with one or more other users.

9.   (Currently Amended) The device of claim 8, further comprising

a host controller coupled with the multi-port data switch, the host controller generates
a partitioning of the R-matrix wherein the R-matrix is divided by the partitioning into
one or more portions,

the host controller synchronizing the generation of the R-Matrix on the set of second
processing elements such that each of the second processing elements within the set
generates a portion of the R-Matrix according to the partitioning,

wherein each of the second processing elements within the set coupled to the multi-port
data switch, the second processing elements each placing its respective portion of the R-
matrix in memory accessible by the third processing element.

10.   (Currently Amended) The device of claim 9, further comprising

the host controller generating a new partitioning when a user is added or removed from
the spread spectrum system, and

the set of second processors generating the portions of the R-matrix according to the
new partitioning.

11.   (Currently Amended) The device of claim 8, further comprising

5

Application No. 10/099,883   Docket No.: 102323-0099

a memory coupled with the first processing element and the set of second processing elements,

wherein the first processor places placing in the memory the gamma matrix,

the first processor element updating the gamma matrix to reflect the addition or removal of a user from the system.

12.   (Currently Amended) The device of claim 11, further comprising

a memory coupled with the set of second processing elements and the third processing element,
wherein the set of second processing elements places placing in the memory the portions of the R-matrix.

13.   (Canceled)

14.   (Original) The device of claim 8, wherein

the set of second processing elements generates the R-matrix of cross-correlations among user waveforms as a composition of the gamma matrix, a first component that represents correlations among time lags and a second component that represents correlations among multipath signal amplitudes and phase shifts associated with the waveforms transmitted by the users.

15.   (Original) The device of claim 8, wherein

the third processing element generates the symbol estimates based on a composition of the R-matrix.

16.   (Currently Amended) A communications device for detecting user transmitted symbols encoded in spread spectrum user waveforms (hereinafter "user waveforms") comprising

6

Application No. 10/099,883   Docket No.: 102323-0099

a first processing element which generates a <u>gamma</u> matrix ~~(hereinafter "gamma matrix")~~ representing a correlation between a code associated with one user and those associated with one or more other users,

a set of one or more second processing elements coupled with the first processing element, the set of processing elements generating ~~a~~ <u>an</u> R-matrix ~~(hereinafter "R-matrix")~~ representing cross-correlations among user waveforms, <u>and</u>

a third processing element coupled with the set of processing elements, the <u>third</u> ~~further~~ processing element generates symbol estimates<u>, and</u>

<u>a host controller coupled to each of the set of second processing elements, the host controller generating a partitioning of the R-matrix, wherein that partitioning divides the R-matrix into one or more portions based on a number of users and a number of available second processing elements.</u>

17.   (Currently Amended) The device of claim 16, <u>further</u> comprising

a memory that is coupled to the first processing element and the set of second processing elements,

<u>wherein</u> the first processing element <u>places</u> ~~placing~~ the gamma matrix in the memory for access by the set of second processing elements.

18.   (Currently Amended) The device of claim 17, <u>further</u> comprising

a multi-port data switch coupled to the first processing element and to the memory,

<u>wherein</u> the first processing element places the gamma matrix in the memory via the data switch.

7

19.   (Currently Amended) The device of claim 16, <u>wherein</u> ~~comprising~~

~~a host controller coupled to each of the set of second processing elements, the host~~
~~controller generates a partitioning of the R-matrix, that partitioning divides the R-matrix~~
~~into one or more portions based on a number of users and a number of available second~~
~~processing elements,~~

the host controller assigns to each second processing element within the set of second
processing elements a portion of the R-matrix to generate according to the partitioning,

<u>wherein</u> each one of the set of second processing elements generates the assigned portion
of the R-matrix according to the partitioning, <u>and</u>

<u>wherein</u> the host re-calculates the partitioning of the R-matrix when a user is added or
removed from the spread spectrum system, and assigns a new portion of the R-matrix to
each second processing element within the set of second processing elements according
to that <u>recalculated</u> ~~new~~ partitioning.

20.   (Currently Amended) The device of claim 16, <u>further</u> comprising

a memory that is coupled to each of the processing elements in the set of second
processing elements and the third processing element,

<u>wherein</u> the set of second processing elements each <u>places</u> ~~placing~~ its respective portion
of the R-matrix in the memory for access by the third processing element.

21.   (Currently Amended) The device of claim 20, <u>further</u> comprising

a multi-port data switch coupled to each of the processing elements in the set of
processing elements and to the memory,

Application No. 10/099,883   Docket No.: 102323-0099

wherein each of the set of second processing elements <u>places</u> ~~placing~~ its respective portion of the R-matrix in the memory via the data switch.

22.   (Currently Amended) The device of claim 16, <u>wherein</u> ~~comprising~~

~~a host controller coupled with the first processing element, the set of processing elements,~~
~~and the further processing element,~~

the host controller synchronizes data flow between the first processing element and the set of second processing elements, <u>and</u>

<u>wherein</u> the host controller synchronizes data flow between the set of second processing elements and the third processing element.

9